START

0012643

January 15, 1991

Meeting Minutes Transmittal/Approval
Unit Managers Meeting: 100 Aggregate Area Operable Units
450 Hills Street, Room 47, Richland, Washington

Meeting Held December 19, 1990

From/
Appvl.: _____ Date: Jan 29, 1991
James D. Goodenough, 100-HR-1/DR-1/BC-1/KR-1 Unit Manager, DOE-RL (A5-19)

Appvl.: _____ Date: Jan 24, 1991
K. Michael Thompson, 100-HR-3/BC-5/NR-1/KR-4 Unit Manager, DOE-RL (A5-19)

Appvl.: _____ Date: Jan 24, 1991
Paul M. Pak, 100-NR-3 Unit Manager, DOE-RL (A5-19)

Appvl.: Not Present (AS CORRECTED) Date: 1/23/91
Larry Goldstein, 100-HR-1/BC-1/BC-5/NR-1/KR-1 Unit Manager, WA Department of Ecology

Appvl.: _____ Date: 1/24/91
Charles S. Cline, 100-HR-3/DR-1/NR-3/KR-4 Unit Manager, WA Department of Ecology

Appvl.: _____ Date: 1/24/91
Douglas R. Sherwood, 100-HR-1/HR-3/DR-1/BC-1/BC-5 Unit Manager, EPA (B5-01)

Appvl.: _____ Date: 24 Jan 91
David R. Einan, 100-KR-1/100-KR-4 Unit Manager, EPA (B5-01)

Meeting Minutes are attached. Minutes are comprised of the following:

Attachment #1 - Meeting Summary/Summary of Commitments and Agreements
Attachment #2 - Attendance List
Attachment #3 - 100-HR-1/HR-3/DR-1 Agenda
Attachment #4 - Commitments/Agreements Status List
Attachment #5 - Process Effluent Pipeline Integrity Assessment / Air Compliance Finding
Attachment #6 - Memo - Greenhouse Emissions Limits for Two Radioactive Chemicals
Attachment #7 - 100-HR-1/HR-3/DR-1 Schedule

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100 Aggregate Area Operable Units Managers Meeting
December 19, 1990

Prepared by: Bill Fryer, SWEC Support Services Date: 1/24/91

Concurrence by: WHC HR-1 RI Coordinator Date: 24 Jan 91

Concurrence by: WHC HR-3 RI Coordinator Date: 1/24/91

Concurrence by: WHC DR-1 RI Coordinator Date: 1/24/91

Concurrence by: WHC BC-1 RI Coordinator Date: 1/24/91

Concurrence by: WHC BC-5 RI Coordinator Date: 1/24/91

Concurrence by: WHC NR-1 RI Coordinator Date: 1-24-91

Concurrence by: WHC NR-3 RI Coordinator Date: 1-24-91

Concurrence by: WHC KR-1 RI Coordinator Date: 1/24/91

Concurrence by: WHC KR-4 RI Coordinator Date: 1/24/91

100 Aggregate Area Operable Units Managers Meeting
December 19, 1990

Distribution:

Donna Lacombe, PRC
Ward Staubitz, USGS
Diane Clark, DOE (A5-55)
Doug Fassett, SWEC (A4-35)
Mary Harmon, DOE-HQ (EM-442)
KaeRae Parnell, WHC (H4-18)
Tom Wintczak, WHC (B2-15)
Mel Adams, WHC (H4-55)
Merl Lauterbach, WHC (H4-55)
Tim Veneziano, WHC (B2-35)

Ronald D. Izatt (A6-95)
Director, DOE-RL, ERD
Ronald E. Gerton (A6-80)
Director, DOE-RL
Roger D. Freeberg (A6-95)
Chief, Rstr. Br., DOE-RL/ERD
Steven H. Wisness
Tri-Party Agreement, Prog. Mgr.
Richard D. Wojtasek (B2-15)
Prgm. Mgr. WHC

ADMINISTRATIVE RECORD: 100-HR-1, 100-HR-3, 100-DR-1, 100-BC-1, 100-BC-5, 100-KR-1, 100-KR-4, 100-NR-1, 100-NR-3; Care of Susan Wray, WHC (H4-51C)

Please inform Doug Fassett (SWEC) of deletions or additions to the distribution list.

Attachment #1

Meeting Summary and Summary of Commitments and Agreements

100 Aggregate Area Operable Units Managers Meeting
December 19, 1990

100-BC-1/BC-5

A report was made by Fred Roeck (WHC). The final draft for BC-1 and BC-5 is due back to the Regulators by February 1. 1991. Doug Sherwood (EPA) requested that they be notified beforehand if there are any points to the DOE comments that cannot be resolved or that contradict previous agreements on EPA comments.

100-KR-1/KR-4

A report was made by Fred Roeck (WHC). *The revised draft B* work plans went to DOE on November 27 1990 and arrived at EPA December 5, 1990. The delay from October to November was due to budget.

100-NR-1/NR-3

A report was made by Bill Green (WHC). The work plans for 100-NR-1 and 100-NR-3 were submitted to DOE on ~~November 12,~~ Sept. 28, WCC 1990. The collected DOE internal comments should be submitted to WHC by December 28, 1990.

100-HR-1/HR-3/DR-1

Action Item Status

Action Item #HR1.24: Open. The QARD is on hold. Requirements in the document could shut down activities on the site and DOE is questioning the document's legitamacy.

Action Item #HR1.27: Closed. Item duplicates #HR1.26.

Action Item #HR1.28: ~~Closed.~~ Open 69 Complete digitized topographic data should be submitted shortly after the 1st of the year. Kaiser will field check the data, and WHC will identify and name man-made features. The data will then be turned over to HEIS, probably in April/May.

Action Item #HR1.29: Open. Updates on the cooling-water discharge pipeline vent pipes will be presented at succeeding UMM meetings.

100-HR-1 Status

1. Jeff Ayres (WHC) reported on the schedule (see Attachment #4).

2. Roberta Day distributed an information package on the Process Effluent Pipeline Integrity Assessment/Air Compliance Finding (see Attachment #5). This handout should meet the substantive requirements of an air-compliance permit and since the action is under CERCLA, per the TPA the procedural requirements do not have to be met. Doug Sherwood (EPA) and Chuck Cline (Ecology) agreed that the work could proceed based on this document without an Air Quality Permit. WHC should notify both the Washington Department of Health and the EPA Air Representative. The greenhouse and HEPA system have been installed. *[Note: Roberta Day (WHC) informed Jim Goodenough (DOE) that DSHS is reviewing this and has not yet agreed to it.]*

3. The GPR survey was started on 100-HR-1 and has proven effective in locating the 1607-H-2 tanks and tile fields. GPR should be finished on the remaining 6 sites by mid to end of February.

4. The vadose zone data compilation activity is on-going.

5. The ecological investigations for all three sites have started; data compilation is almost complete and the winter walk-through for endangered species is done.

6. The data compilation report has been submitted to DOE and should be out in the next week or so.

<u>100-DR-1 Status</u>

7. Naik Naiknimbalkar (WHC) reported that source data compilation is on schedule, but that topographic mapping was a little behind. No field activites are in progress; GPR will start after 100-HR-1 is finished. Doug Sherwood (EPA) asked if cribs on site, where fences had been removed, would be remarked using the GPR survey data. Merle Lauterbach (WHC) replied that he thought those sites have AC540 markers. Sufficient control should be established with the GPR survey to locate and mark the cribs if there is a question later.

<u>100-HR-3 Status</u>

8. Source data compilation will be done for this unit after it is done for 100-DR-1 (after the 1st of the year). The status of data compilation for other activities is the same as for the other two sites.

<u>Hanford Reach Surveillance</u>

9. Alan Krug (WHC) reported that no action has been taken onsite. It has been determined that the Floodplain Assessment process won't be required due to an exclusionary clause the DOE can invoke. There is no answer yet as to the need for an ACE permit; the possibility of an exclusion because of the limited area and depth of excavation is being investigated. The Corps has already indicated *that they would probably approve the permit, once they receive it.* This covers removal of the vent pipes only, removal of the discharge pipes themselves would require a full-scale engineering study. Doug Sherwood (EPA) suggested that

(EPA) suggested that letters to the Natural Resources Trustees should go out ASAP to avoid delay in case any study or assessment is required.

Concurrent Reviews

10. Ecology has sent a letter to WHC indicating that they will no longer follow the expedited review scheduling and that the TPA specified process should be followed. They want the work plan to be fully acceptable to the DOE before submittal to the regulators. Doug Sherwood (EPA) stated for the record that EPA does not concur, they want the work plans as early as possible. Mr. Sherwood stated that whichever agency is lead can submit all of the regulator's comments at their discretion. Ecology has indicated that they won't submit their comments on 100-NR-1 until February 1st, in accordance with the original schedule, rather than by the expedited schedule date of 12/12/90. (March 91)

Administrative Record for Aggregate Area Meetings

11. Doug Sherwood (EPA) questioned the distribution of the meeting minutes into the administrative record for aggregate area meetings. Mike Thompson (DOE) stated that the minutes should be placed into the record for each of the operable units covered by the meeting.

ACTION ITEM #HR1.30: Check previous UMM minutes to identify outstanding action items. Aggregate 100 area UMM minutes will be placed into the file of each 100 area operable unit included in the meeting. Action: Doug Fassett (12/19/90)

Attachment #2

Attendance List

100 Aggregate Area Operable Units Managers Meeting
December 19, 1990

Name	Organization\Responsibility		Phone
Thompson, Mike	DOE-RL	Unit Mgr.	509-376-6421
Cline, Chuck	Ecology	Unit Manager	206-438-7556
Cross, Steve	Ecology	CERCLA Unit	206-459-6675
Einan, Dave	EPA	KR-1, 4 Unit Mgr.	509-376-3883
Sherwood, Doug	EPA	Unit Manager	509-376-9529
Lacombe, Donna	PRC	EPA Contractor	206-624-2692
Davis, Kathy	SWEC	GSSC	509-376-0412
Fassett, Doug	SWEC	GSSC	509-376-9969
Fryer, Bill	SWEC	GSSC	509-376-9707
King, Joe	SWEC	GSSC	509-376-9969
Ayres, J. M.	WHC	100-HR-1	509-376-3918
Day, Roberta	WHC	100-HR-3	509-376-2499
Green, Bill	WHC	100-NR-1, 3	509-376-3886
Naiknimbalkar, Naik	WHC	100-DR-1	509-376-8739
Roeck, Fred	WHC	KR-1, 4	509-376-8819
Greenwell, Wendell	USAC	COE	
Drost, Brian	USGS	EPA Support	206-593-6510
Staubitz, Ward	USGS	EPA Support	206-593-6510

Attachment #3

Agenda

100 Aggregate Area Operable Units
December 19, 1990

- Meeting Minutes
- 100-HR-1 Status
- 100-DR-1 Status
- 100-HR-3 Status
- Hanford Reach Surveillance
- Groundwater Monitoring Results for 183-H
- Action Items

Attachment #4

Commitments/Agreements Status List

100-HR-1/HR-3/DR-1 Operable Unit
December 19, 1990

Item No.	Action	Status
BC.1:	A presentation on the Environmental Restoration Document is planned for the next meeting. Action: Jim Patterson	~~Open~~ (9/20/90) Closed
HR1.24:	This item was moved the General Topics Action Item list (1/15/90).	
HR1.25:	The HR and DR work plans will be reviewed by the regulators for incorporation of their comments. Public review is on hold pending DOE-RL review of cost estimates. DOE will provide a schedule for the cost estimates by the next operable unit manager meeting. Action: Jim Goodenough (10/17/90, HR1-UMM)	Open
HR1.26	Provide a schedule to Ecology for the completion of the HR-1, HR-3 and DR-1 work plans. Action: Mike Thompson, Jim Goodenough (10/16/90, GT.UMM)	Open
HR3.27	Determine the next critical date for completing the HR-3 work plan. Action: Bob Stewart (10/16/90, GT.UMM)	Open
HR1.28	Determine when the topographic mapping will be available on HEIS, who is responsible for digitizing the mapping, and when it will be available. Action: Alan Krug (11/15/90)	Open
HR3.29	Provide regulators with information about the situation concerning the cooling-water discharge pipeline/vent pipes on the island opposite D reactor. Action: Jim Goodenough (11/15/90)	Open

HR1.31	*Resolve the question of DSHS agreement on the Process Effluent Pipeline Integrity Assessment/Air Compliance Finding. Action: L. Goldstein (1/15/90)*	*Open*
HR3.32	*Regarding the removal of the vent pipes, WHC will: 1) Determine the need for an ACE permit; 2) obtain a letter from ACE that gives approval to begin work before the need for the permit is determined; and, 3) draft letters on the matter to the Natural Resources Trustees. Action: A. Krug (1/15/90)*	*Open*
HR1.33	*Place Ecology's letter, regarding their nonacceptance of the concurrent review process, in the Administrative Record. Action: ~~A. Krug~~ (1/15/90)* Paul Pak (or Nancy Werdel) 1/29/91	*Open*

Process Effluent Pipeline Integrity Assessment / Air Compliance Finding

Article XVII of the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) gives criteria for compliance with the substantive requirements that would be included in a federal, state, or local permit. The criteria is as follows: The permit must be identified; the standards, requirements, criteria, or limitations which would have had to have been met must be identified; and an explanation of how the response action proposed will meet the standards, requirements, criteria or limitations identified. Upon the request of DOE, EPA and Ecology will provide their positions with respect to the above criteria.

Identified Permit: Clean Air Act (CAA) permitting of exhaust points.

Standards, Requirements, Criteria, or Limitations: The objective of the CAA is to protect and enhance the quality of the nation's air resources in order to promote and maintain public health and welfare and the productive capacity of the population. The state requires you to permit the source when the released dose is greater than or equal to 0.1 mrem at the site boundary, using the release and dose calculation method in 40 CFR 61.

Response Actions Met. The 100-HR-1 Process Effluent Pipeline Integrity Assessment will be using a greenhouse exhausted by a HEPA system. The initial placement of the greenhouse and HEPA system was done to protect the environment from possible releases due to the cutting of the concrete and pipe. The greenhouse/HEPA system placement meets the substantive requirements of the CAA.

An additional AIRDOS-PC report was done in accordance with subpart H of 40 CFR 61 to evaluate the need for State permits. The report concluded that the normal administrative controls on workers are more than sufficient to meet the offsite dose limits in 40 CFR 61, subpart H. Attached is a copy of the report.

Westinghouse Hanford Company

Internal Memo

From: Environmental Technology Group 81210-90-167
Phone: 6-8506 H4-14
Date: December 4, 1990
Subject: GREENHOUSE EMISSIONS LIMITS FOR TWO RADIOACTIVE MATERIALS

To: R. E. Day H4-55

cc: J. A. Bates B2-19
L. E. Borneman H4-57
J. S. Davis N1-31
R. J. Van Vleet N1-31
JWC:PDR File/LB

The attached report describes the basis for allowing work in HEPA-filtered greenhouse containments to proceed at the 100-H process effluent pipeline.

The 100-H reactor had a once-through cooling system. Therefore, the only two materials assumed to be of concern at the 100-H liquid effluent pipeline are cobalt-60 and a mixed fission product mixture (MFP). Since the reactor has been out of use for decades, the assumed composition of the MFP was assumed to be strontium-90 and cesium-137 in equal amounts.

To avoid the need for state permits to operate, the amount which could be released must produce a dose less than 0.1 mrem at the site boundary, using the release and dose calculation method in Appendix D of 40 CFR 61.

Using this method, the allowed amounts are far greater than can be safely worked with in close contact. The external dose rates from these allowed amounts would exceed 100 R/hr at a distance of 3 feet with no shielding.

Therefore, the normal administrative controls on workers to limit external exposure during greenhouse construction and operation are more than sufficient to meet the offsite dose limits in 40 CFR 61, Subpart H.

If you have any questions concerning the attached calculations please call P. D. Rittmann at 6-8715.

J W Cammann

J. W. Cammann
Manager

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Attachments

Greenhouse Emissions Limits for Two Radioactive Materials

by Paul D. Rittmann, PhD CHP

A recent audit questioned whether work in HEPA-filtered greenhouse containments should proceed without Washington State construction and operation permits. In particular, this has caused a work stoppage at the 100-H process effluent pipeline. The purpose of this report is to evaluate the need for State permits according to subpart H of 40 CFR 61.

Overview of Method

The amount which conservatively could be released to the environment is normally estimated using the following procedure. First, the likely inventory in a greenhouse is estimated, and second, the EPA resuspension and effluent treatment system release factors are then applied to the inventory. However, in most greenhouse work it is nearly impossible to know in advance how much radioactivity will be handled. Therefore, this particular case was worked backwards. Starting from the EPA offsite dose limit of 0.1 mrem, the maximum amount which could be handled inside a greenhouse containment was estimated.

The first step is to assume something about the composition of the radioactive materials which may be present in the greenhouse. Since the 100-H reactor had a once-through cooling system, the materials assumed to be of concern at the 100-H liquid effluent pipeline are cobalt-60 and a mixed fission product mixture (MFP). Since the reactor has been out of use for decades, the assumed composition of the MFP was assumed to be entirely strontium-90 and cesium-137 in equal amounts. The uranium fuel itself is ignored due to the greater doses which result from MFP.

The second step is to determine the amounts of Co-60 or MFP which could be released to the air as respirable particles to produce the EPA dose limit of 0.1 mrem per year at the site boundary. The AIRDOS-PC (Version 3.0) program was used for this.

The third step is to apply the resuspension and HEPA filter release factors in Appendix D of 40 CFR 61, to determine the facility inventory limits. The release factor for liquids and particulates is 0.001, and the cleanup factor for the HEPA filter is 0.01, giving an overall release factor of 1×10^{-5}.

A final calculation was performed using ISOSHLD-PC to establish the likely external dose rates which these inventory limits would produce inside the greenhouse containment.

The details of the methods and computed results are given below.

Release Limits Based on AIRDOS-PC

AIRDOS-PC is a set of computer codes which performs atmospheric transport and dose calculations. Atmospheric transport calculations are carried out using a modified Gaussian plume model to estimate horizontal and vertical dispersion

of radionuclides from 1 to 6 stacks or area sources. The code calculates radionuclide concentrations in air, rates of deposition on ground surfaces, ground surface concentrations, and intake rates via inhalation and ingestion. The exposure pathways considered include immersion in air containing suspended radionuclides, exposure from radionuclides deposited on ground, inhalation of airborne radionuclides, and ingestion of local food contaminated by released material. Ingestion doses are estimated using the U.S. Nuclear Regulatory Commission Regulatory Guide 1.109 terrestrial food chain models and standard consumption parameters contained in the AIRDOS-PC code.

The agricultural data and the maximum individual (MI) inhalation and ingestion rates supplied with the code are not readily modified. Therefore, default values supplied with the code were accepted.

External and internal dose factors are supplied as part of the AIRDOS-PC package. The dosimetry model used corresponds to that of the International Commission on Radiological Protection (ICRP 1977, 1979), except that it uses a 70 year committed effective dose equivalent rather than the 50 year period recommended by ICRP.

The distance from 100-H to the site boundary varies with direction. The shortest distance in each direction is listed on the table below. Boundary locations in the Columbia River use the far bank of the river, since the USDOE prohibits residential use of the near bank. Note that the directions given on the table are transport directions. Facility and boundary coordinates were taken from USGS 7.5 minute series maps.

Distances to the Site Boundary

Transport Direction	Distance meters	Transport Direction	Distance meters
S	35600	N	10500
SSW	33300	NNE	10300
SW	28600	NE	10000
WSW	22400	ENE	10000
W	13300	E	10400
WNW	11400	ESE	11500
NW	10300	SE	14600
NNW	10600	SSE	31600

It turns out that receptors to the east 10.4 km will have the greatest doses, so this location was used in the AIRDOS-PC calculations. Due to the site specific wind data used, the shortest distances did not give the largest doses.

The release height used in the calculations was 10 meters, corresponding to the height of the joint frequency data. An annual average plume rise of 0 meters was entered, rather than allowing AIRDOS-PC to calculate the values.

AIRDOS-PC does not include a printout of the calculated dispersion parameter X/Q, the normalized integrated exposure. For this reason, none is shown in this report.

Results of the AIRDOS-PC calculations for the one curie annual release are shown in Attachment 2. The resulting doses are summarized in the table below. One curie of MFP is taken to be 0.5 Ci Sr-90, 0.5 Ci Y-90, 0.5 Ci Cs-137, and 0.473 Ci Ba-137m.

AIRDOS-PC (Version 3.0) Results	Co-60	MFP
AIRDOS-PC Dose, for 1 Ci Release:	0.25	0.22 mrem/yr
Release Amount to Give EPA Limit:	0.400	0.455 Curies
Annual Total Handling Limit:	4.0E+04	4.5E+04 Curies
Average Handling Limit:	7.7E+02	8.7E+02 Curies

Note: MFP means 0.5 Ci Sr-90 and 0.5 Ci Cs-137, along with 0.5 Ci Y-90 and 0.473 Ci Ba-137m.

The last line in the table is the average amount assuming the greenhouses were in operation for only one week, but that there were about 52 greenhouses used per year. Thus a reasonable limit on a "one week" greenhouse is 770 curies of Co-60, or 870 curies of MFP.

External Dose Rates from the Inventory Limits

The above handling limits are quite large. To put these numbers in perspective, the external dose rates from a point source at a distance of 1 meter were computed using the ISOSHLD-PC program (Version 1.6). The input file is included in Attachment 3, for reference. Exposure rates are shown in the table below for a point source with no shield, with 1 inch of iron, and with 1 foot of concrete.

Dose Rates from ISOSHLD-PC (Version 1.6), R/hr

	1 Ci at 1 m		1 week Greenhouse	
	Co-60	MFP	Co-60	MFP
no shield	1.33	0.181	1.0E+03	1.6E+02
1 inch iron	0.917	0.103	7.0E+02	9.0E+01
1 foot concrete	0.112	0.00617	8.6E+01	5.4E+00

Notice that the smallest dose rate, from MFP through 1 foot of concrete, is still above the 5 R/hr limit for occupational work. Thus, it is not possible to have a working greenhouse with enough activity to exceed the environmental limits.

It is important that the effluent treatment system be properly tested to ensure that the greenhouse emissions qualify as filtered.

Note also that the above conclusion only applies to greenhouses working with Co-60 and an even mixture of Cs-137 and Sr-90. Greenhouses built to contain uranium, plutonium, or MFP which is largely Sr-90 need to be analyzed by this or similar methods to establish that they will meet the environmental laws.

CHECKLIST FOR CALCULATION REVIEW

Document Reviewed: "GREENHOUSE EMISSIONS LIMITS FOR TWO RADIOACTIVE MATERIALS" Internal Memo to R. E. Day

Author: Paul D. Rittmann

Yes	No	N/A	General Considerations
[X]	[ ]	[ ]	Problem completely defined.
[X]	[ ]	[ ]	Necessary assumptions explicitly stated and supported.
[X]	[ ]	[ ]	Computer codes and data files documented.
[X]	[ ]	[ ]	Data used in calculations explicitly stated in document.
[X]	[ ]	[ ]	Data checked for consistency with original source information as applicable.
[X]	[ ]	[ ]	Mathematical derivations checked including dimensional consistency of results.
[X]	[ ]	[ ]	Models appropriate and used within range of validity or use outside range of established validity justified.
[ ]	[ ]	[X]	Hand calculations checked for errors.
[X]	[ ]	[ ]	Code runstreams correct and consistent with analysis documentation.
[X]	[ ]	[ ]	Code output consistent with input and with results reported in analysis documentation.
[X]	[ ]	[ ]	Acceptability limits on analytical results applicable and supported. Limits checked against sources.
[X]	[ ]	[ ]	Safety margins consistent with good engineering practices.
[X]	[ ]	[ ]	Conclusions consistent with analytical results, applicable limits, and address all points required in the problem statement.

Rick J. Van Vleet — 12/04/1990
Technical Reviewer Approval — Date

Yes	No	N/A	Environmental Impact Calculations
[X]	[ ]	[ ]	Appropriate computer program(s) used for calculations.
[X]	[ ]	[ ]	Appropriate receptor locations evaluated.
[X]	[ ]	[ ]	Appropriate exposure pathways evaluated for each receptor.
[X]	[ ]	[ ]	Appropriate models (finite plume, building wake, etc.) used.
[X]	[ ]	[ ]	Input data specific to the Hanford Site used where possible.
[X]	[ ]	[ ]	Analysis consistent with other HEDOP recommendations.

Rick J. Van Vleet — 12/04/1990
HEDOP Reviewer Approval — Date

CHECKLIST FOR CALCULATION REVIEW

Document Reviewed: "GREENHOUSE EMISSIONS LIMITS FOR TWO RADIOACTIVE MATERIALS" Internal Memo to R. E. Day

Author: Paul D. Rittmann

Scope: Shielding Calculations

Yes	No	N/A	General Considerations
[X]	[ ]	[ ]	Problem completely defined.
[X]	[ ]	[ ]	Necessary assumptions explicitly stated and supported.
[X]	[ ]	[ ]	Computer codes and data files documented.
[X]	[ ]	[ ]	Data used in calculations explicitly stated in document.
[X]	[ ]	[ ]	Data checked for consistency with original source information as applicable.
[X]	[ ]	[ ]	Mathematical derivations checked including dimensional consistency of results.
[X]	[ ]	[ ]	Models appropriate and used within range of validity or use outside range of established validity justified.
[X]	[ ]	[ ]	Hand calculations checked for errors.
[X]	[ ]	[ ]	Code runstreams correct and consistent with analysis documentation.
[X]	[ ]	[ ]	Code output consistent with input and with results reported in analysis documentation.
[X]	[ ]	[ ]	Acceptability limits on analytical results applicable and supported. Limits checked against sources.
[X]	[ ]	[ ]	Safety margins consistent with good engineering practices.
[X]	[ ]	[ ]	Conclusions consistent with analytical results, applicable limits, and address all points required in the problem statement.

David C Reece 12/4/90

Technical Reviewer Approval Date

Attachment 2: AIRDOS-PC Output Files

40 CFR Part 61
National Emission Standards
for Hazardous Air Pollutants

CLEAN AIR ACT COMPLIANCE REPORT
(Version 3.0 November 1989)

Facility: H-Reactor Area Release
Address: PO Box 1970
Richland , WA. 99352
Annual Assessment for Year: 1991
Date Submitted: 11/13/90

Comments: Greenhouse Emission Limits

Prepared By:

Name: Paul D. Rittmann, PhD CHP
Title: Principal Engineer
Phone #: (509) 376-8715

Prepared for:
U.S. Environmental Protection Agency
Office of Radiation Programs
Washington, D.C. 20460

CLEAN AIR ACT COMPLIANCE REPORT 11/13/90 7:20 AM

Facility: H-Reactor Area Release
Address: PO Box 1970 City: Richland State: WA
Comments: Greenhouse Emission Limits
Year: 1991

	Dose Equivalent Rates to Nearby Individuals (mrem/year)
Effective Dose Equivalent	0.2500
Highest Organ Dose is to GONADS	0.2800

----------EMISSION INFORMATION----------

Radio-nuclide	Class	Amad	Stack #1 (Ci/y)
CO-60	Y	1.0	1.0E+00

Stack Height (m)	10.00
Stack Diameter (m)	0.50

	--A--	--B--	--C--	--D--	--E--	--F--	--G--
Entered (m):	0.00	0.00	0.00	0.00	0.00	0.00	0.00

----------SITE INFORMATION----------

Wind Data	JF10010.WND	Temperature (C)	12
Food Source	LOCAL	Rainfall (cm/y)	16
Distance to Individuals (m)	10400	Lid Height (m)	1000

*NOTE: The results of this computer model are dose estimates. They are only to be used for the purpose of determining compliance and reporting per 40 CFR 61.93 and 40 CFR 61.94.

11/13/90 7:20 AM

ORGAN DOSE TO THE MAXIMALLY EXPOSED INDIVIDUAL

ORGAN	DOSE EQUIVALENT RATE TO THE ORGAN (mrem/y)
GONADS	2.8E-01
BREAST	2.6E-01
RED MARROW	2.2E-01
LUNGS	2.7E-01
THYROID	2.7E-01
ENDOSTEUM	2.3E-01
REMAINDER	2.4E-01
EFFECTIVE	2.5E-01

DOSE TO THE MAXIMALLY EXPOSED INDIVIDUAL
BY PATHWAY FOR ALL RADIONUCLIDES

	EFFECTIVE DOSE EQUIVALENT (mrem/y)	DOSE EQUIVALENT TO THE ORGAN WITH THE HIGHEST DOSE GONADS (mrem/y)
INGESTION	2.3E-02	2.1E-02
INHALATION	8.4E-03	6.5E-04
AIR IMMERSION	6.2E-05	7.2E-05
GROUND SURFACE	2.2E-01	2.6E-01
TOTAL:	2.5E-01	2.8E-01

H-Reactor Area Release

11/13/90 7:20 AM

DOSE TO THE MAXIMALLY EXPOSED INDIVIDUAL
BY RADIONUCLIDE FOR ALL PATHWAYS

RADIONUCLIDE	EFFECTIVE DOSE EQUIVALENT (mrem/y)	DOSE EQUIVALENT TO THE ORGAN WITH THE HIGHEST DOSE GONADS (mrem/y)
CO-60	2.5E-01	2.8E-01
TOTAL :	2.5E-01	2.8E-01

EFFECTIVE DOSE EQUIVALENT AS A FUNCTION
OF ALL DISTANCES AND ALL DIRECTIONS FOR ALL
RADIONUCLIDES AND ALL PATHWAYS

DIRECTIONS:	N	NNE	NE	ENE	E	ESE	SE	SSE
DISTANCE (METERS):								
10400	8.3E-02	7.5E-02	1.1E-01	1.8E-01	2.5E-01	1.5E-01	1.1E-01	1.0E-01
80000	3.1E-03	2.9E-03	4.7E-03	7.9E-03	1.2E-02	6.4E-03	4.3E-03	3.6E-03

	S	SSW	SW	WSW	W	WNW	NW	NNW
DISTANCE (METERS):								
10400	1.1E-01	6.4E-02	7.5E-02	8.8E-02	1.7E-01	1.1E-01	8.7E-02	5.8E-02
80000	4.4E-03	2.6E-03	2.7E-03	3.3E-03	6.2E-03	4.2E-03	3.5E-03	2.4E-03

40 CFR Part 61
National Emission Standards
for Hazardous Air Pollutants

CLEAN AIR ACT COMPLIANCE REPORT
(Version 3.0 November 1989)

Facility: H-Reactor Area Release
Address: Westinghouse Hanford Company
Richland , WA. 99352
Annual Assessment for Year: 1991
Date Submitted: 11/14/90

Comments: Greenhouse Emissions

Prepared By:

Name: Paul D. Rittmann, PhD CHP
Title: Principal Engineer
Phone #: (509) 376-8715

Prepared for:
U.S. Environmental Protection Agency
Office of Radiation Programs
Washington, D.C. 20460

CLEAN AIR ACT COMPLIANCE REPORT 11/14/90 11:30 AM

Facility: H-Reactor Area Release
Address: Westinghouse Hanford Company City: Richland State: WA
Comments: Greenhouse Emissions
Year: 1991

	Dose Equivalent Rates to Nearby Individuals (mrem/year)
Effective Dose Equivalent	0.2200
Highest Organ Dose is to ENDOSTEUM	1.1

----------EMISSION INFORMATION----------

Radio-nuclide	Class	Amad	Stack #1 (Ci/y)
SR-90	D	1.0	5.0E-01
Y-90	W	1.0	5.0E-01
CS-137	D	1.0	5.0E-01
BA-137M	D	1.0	4.7E-01
BA-137M	D	1.0	0.0E-01
Stack Height (m)			10.00
Stack Diameter (m)			0.50

	--A--	--B--	--C--	--D--	--E--	--F--	--G--
Entered (m):	0.00	0.00	0.00	0.00	0.00	0.00	0.00

----------SITE INFORMATION----------

Wind Data	JF10010.WND	Temperature (C)	12
Food Source	LOCAL	Rainfall (cm/y)	16
Distance to Individuals (m)	10400	Lid Height (m)	1000

*NOTE: The results of this computer model are dose estimates. They are only to be used for the purpose of determining compliance and reporting per 40 CFR 61.93 and 40 CFR 61.94.

11/14/90 11:30 AM

ORGAN DOSE TO THE MAXIMALLY EXPOSED INDIVIDUAL

ORGAN	DOSE EQUIVALENT RATE TO THE ORGAN (mrem/y)
GONADS	1.5E-01
BREAST	1.4E-01
RED MARROW	5.5E-01
LUNGS	1.2E-01
THYROID	1.5E-01
ENDOSTEUM	1.1E+00
REMAINDER	1.4E-01
EFFECTIVE	2.2E-01

DOSE TO THE MAXIMALLY EXPOSED INDIVIDUAL
BY PATHWAY FOR ALL RADIONUCLIDES

	EFFECTIVE DOSE EQUIVALENT (mrem/y)	DOSE EQUIVALENT TO THE ORGAN WITH THE HIGHEST DOSE ENDOSTEUM (mrem/y)
INGESTION	1.1E-01	9.2E-01
INHALATION	5.0E-03	4.9E-02
AIR IMMERSION	6.0E-10	5.9E-10
GROUND SURFACE	1.0E-01	1.0E-01
TOTAL:	2.2E-01	1.1E+00

H-Reactor Area Release

11/14/90 11:30 AM

DOSE TO THE MAXIMALLY EXPOSED INDIVIDUAL
BY RADIONUCLIDE FOR ALL PATHWAYS

RADIONUCLIDE	EFFECTIVE DOSE EQUIVALENT (mrem/y)	DOSE EQUIVALENT TO THE ORGAN WITH THE HIGHEST DOSE ENDOSTEUM (mrem/y)
SR-90	8.6E-02	9.5E-01
Y-90	1.8E-04	2.0E-05
CS-137	3.0E-02	2.0E-02
BA-137M	6.0E-10	6.0E-10
BA-137M	1.0E-01	1.0E-01
TOTAL :	2.2E-01	1.1E+00

EFFECTIVE DOSE EQUIVALENT AS A FUNCTION
OF ALL DISTANCES AND ALL DIRECTIONS FOR ALL
RADIONUCLIDES AND ALL PATHWAYS

DIRECTIONS:	N	NNE	NE	ENE	E	ESE	SE	SSE
DISTANCE (METERS):								
10400	7.1E-02	6.4E-02	9.8E-02	1.6E-01	2.2E-01	1.3E-01	9.6E-02	8.6E-02
80000	2.7E-03	2.5E-03	4.0E-03	6.8E-03	1.0E-02	5.5E-03	3.7E-03	3.1E-03

	S	SSW	SW	WSW	W	WNW	NW	NNW
DISTANCE (METERS):								
10400	9.4E-02	5.5E-02	6.4E-02	7.6E-02	1.4E-01	9.3E-02	7.5E-02	5.0E-02
80000	3.8E-03	2.2E-03	2.3E-03	2.8E-03	5.3E-03	3.6E-03	3.0E-03	2.0E-03

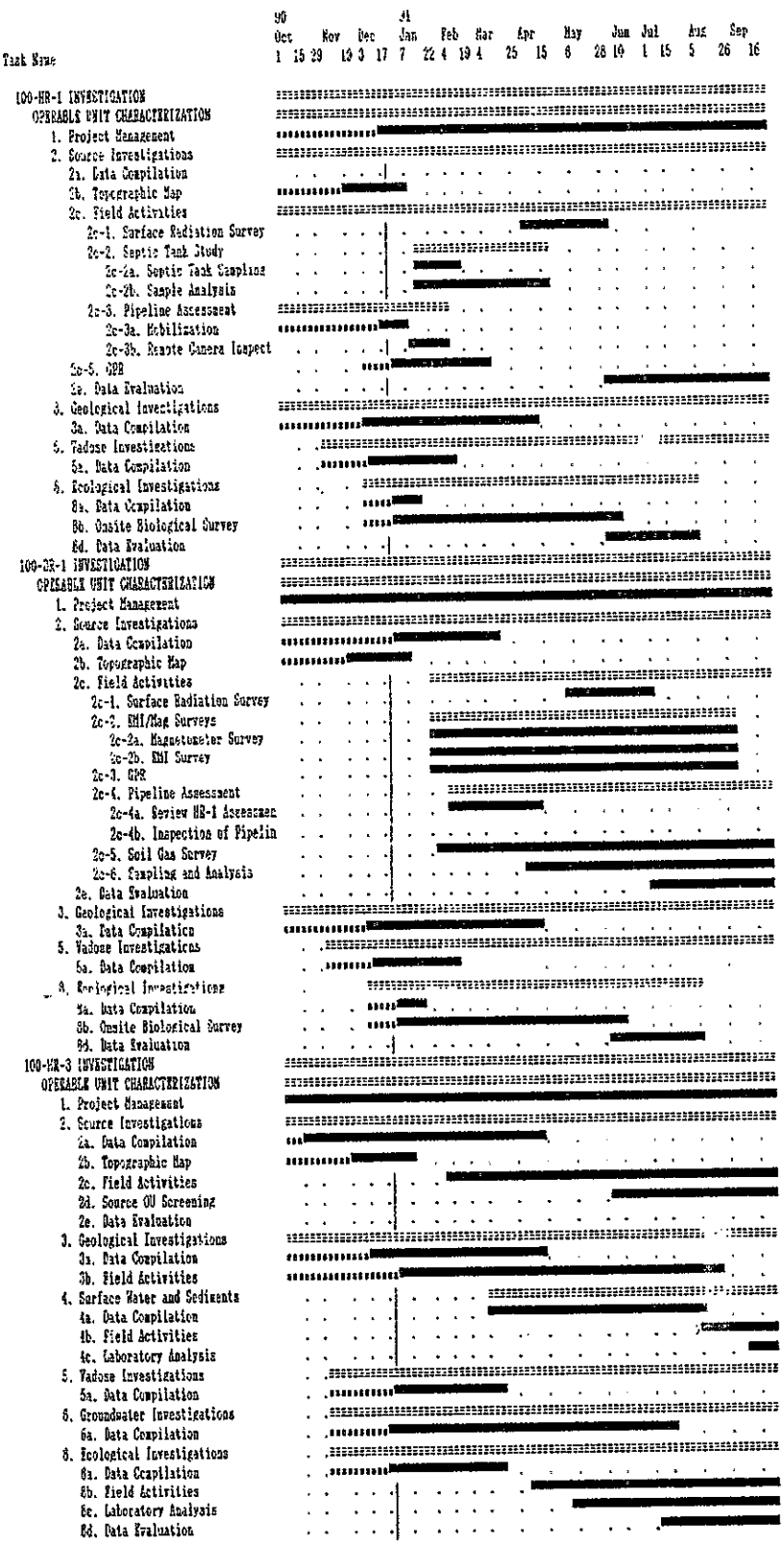
H-Reactor Area Release

Attachment 3: ISOSHLD-PC Input

```
0         2   Dose Rates 1 meter from a Point Source
Co-60 in air
 &Input  Next= 1,  Nshld= 1, JBuf= 1, T(1)= 90,
  IGeom= 1,  X= 100, Y= 0,  Weight(472)= 1  &
1 air    3  0.00129
Co-60 behind 1 inch of iron
 &Input  T(1)= 2.54  &
1 iron   9   7.86
Co-60 behind 1 foot of concrete
 &Input  T(1)= 30.48  &
1 conc  16   2.35
MFP in air
 &Input  Next= 1,  Nshld= 1, JBuf= 1, T(1)= 90,
  IGeom= 1,  X= 100, Y= 0,  Weight(472)= 0,
  Weight(82)= 0.5,  Weight(84)= 0.5,
  Weight(335)= 0.5, Weight(336)= 0.473  &
1 air    3  0.00129
MFP behind 1 inch of iron
 &Input  T(1)= 2.54  &
1 iron   9   7.86
MFP behind 1 foot of concrete
 &Input  T(1)= 30.48  &
1 conc  16   2.35
This is the End of the 100-H Cases !!
  &Input Next= 6  &
```

Schedule Name : 100-HR-3 FY91
Responsible :
As-of Date : 19-Dec-90 Schedule File : FY1991

Select filter : obs



Detail Task ===== Summary Task ***** Baseline
(Progress) ==== (Progress) >>> Conflict
(Slack) ===— (Slack) ..■■■ Resource delay
Progress shows Percent Achieved on Actual ▸ Milestone
Scale: 3 days per character

100 Aggregate Area Operable Units Managers Meeting
December 19, 1990

Distribution:

Donna Lacombe, PRC
Ward Staubitz, USGS
Diane Clark, DOE (A5-55)
Doug Fassett, SWEC (A4-35)
Mary Harmon, DOE-HQ (EM-442)
KaeRae Parnell, WHC (H4-18)
Tom Wintczak, WHC (B2-15)
Mel Adams, WHC (H4-55)
Merl Lauterbach, WHC (H4-55)
Tim Veneziano, WHC (B2-35)

Ronald D. Izatt (A6-95)
Director, DOE-RL, ERD
Ronald E. Gerton (A6-80)
Director, DOE-RL
Roger D. Freeberg (A6-95)
Chief, Rstr. Br., DOE-RL/ERD
Steven H. Wisness
Tri-Party Agreement, Prog. Mgr.
Richard D. Wojtasek (B2-15)
Prgm. Mgr. WHC

ADMINISTRATIVE RECORD: 100-HR-1, 100-HR-3, 100-DR-1, 100-BC-1, 100-BC-5, 100-KR-1, 100-KR-4, 100-NR-1, 100-NR-3; Care of Susan Wray, WHC (~~H4-55~~ H4-22)

Please inform Doug Fassett (SWEC) of deletions or additions to the distribution list.